

# A report on the occurrence of cerebral vascular accidents in chiropractic practice

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Much has been written about the occurrence of cerebral vascular accidents (CVA's) associated with manipulation performed by chiropractors, physiotherapists, physicians and others. This paper will estimate that the incidence of CVA's in chiropractic practice as a possible recognized risk of cervical manipulation is small. An attempt is made to predict the extent of this risk in chiropractic practice from information obtained from claims made in Canada.

Detailed information of the postulated mechanisms and literature review related to the complications and contraindications of cervical manipulations can be found elsewhere.<sup>1,2</sup> To accurately report the incidence of CVA consequent to spinal manipulative therapy (SMT) will require a carefully conducted epidemiological study requiring a sample size significantly large enough to capture the incidence rate. Instead several authors have reported the probability of CVA's based upon projections from small sample surveys or extrapolation from literature reports.<sup>3,4,5</sup>

Another method is a review of the reported legal/insurance claims. In 1986, the Canadian Chiropractic Association founded the Canadian Chiropractic Protective Association (CCPA), providing protection to chiropractors in the eventuality of professional liability cases/claims. For the majority of Canadian chiropractors, this organization has been the sole provider of liability/malpractice protection since 1986. It is the only provider of protection for chiropractors in the four western and the four eastern Canadian provinces. In Ontario, the CCPA provides this benefit for 78 percent of the chiropractors and in Quebec, 79 percent.

The nature and structure of the association assures that virtually every reported claim of alleged professional liability involving a chiropractor is recorded. The CCPA has compiled a data base with files on all claims involving chiropractors dating as far back as 1975. It is the author's opinion that all claims involving a chiropractor in Canada are on record with the CCPA. This is because all claims that do not involve the CCPA (very few) tend to generate public controversy amongst chiropractors and others. Close liaison exists between the CCPA and members of the insurance industry, as well as other health care providers. Indeed, the CCPA frequently hears of the occurrence earlier than the practitioner involved in alleged occurrences.

### Estimated incidence of CVA

Literature relates the incidence of CVA associated with chiropractic manipulation as one per one million.<sup>3</sup> Guttman has estimated 2 or 3 more-or-less serious incidents in about one million manipulative treatments of the upper cervical spine.<sup>4</sup> This incidence rate is supported by Dvorak and Orelli.<sup>5</sup> There has been some reference to mortality rates but these have been speculative at best. Death is an extremely rare complication. In Canada, there have been no reports of death since records have been kept by CCPA. So what has been the experience of the CCPA with the incidents of CVA in chiropractic patients? Central to this understanding is that the CCPA covers virtually all the chiropractors in Canada, and all claims are known to the CCPA.

Canada's population as provided by Statistics Canada was 25,354,000 in 1986 and in 1991 the figure was 27,334,000, with an average for the period of 1986 to 1990 being 26,000,000 people.<sup>6,7</sup> Establishing the exact numbers of manipulations performed in Canada over any 5 year period is very difficult to estimate. However, estimates can be derived from extrapolating information obtained from Government Health Plan records and thus an attempt can be made to calculate the number of manipulations performed by chiropractors.

The numbers used in the following calculations have been provided by the Provincial Health Provider (government bodies), as well as the provincial associations as near as they are able to ascertain. Therefore, the following figures represent minimum estimates and in effect underestimate the actual number of manipulations performed, as they do not include some manipulations performed as a result of Workers' Compensation

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**TABLE I**  
**Projected number of manipulations performed**  
**by chiropractors by province**

Province	Number of chiropractors (1990)	Number of manipulations (1986–1990)
British Columbia	466	11,466,000 <sup>8</sup>
Alberta	366	9,582,000 <sup>9</sup>
Saskatchewan	112	5,949,000 <sup>10</sup>
Manitoba	121	4,000,000 <sup>11</sup>
Ontario	1,610	41,018,000 <sup>12</sup>
Quebec	750	28,000,000 <sup>13</sup>

injuries, motor vehicle accidents, and others performed after patients have utilized their maximum benefits under a government health plan.

Accurate figures are not available in the four eastern provinces and therefore, for the purpose of this paper will be excluded. This will have the effect of further understating the number of manipulations performed in Canada over a five year period. Thus, the total number of manipulations is low, with estimates rounded off to the nearest thousand.

From information from government and health plan records, 100,015,000 manipulations are estimated to be performed in Canada in six provinces over a 5 year period (see Table I). It might be interesting to note that, during this period, no cerebral vascular accidents were reported to the CCPA in the eastern four provinces of Canada and only one claim occurred in the province of Quebec, in which 28,000,000 manipulations were estimated. In the rest of Canada, 13 CVA incidents were reported or are known to have occurred. Now it could be argued that perhaps the incidence of CVA's is under reported. However, it is the author's experience with claim review and discussion with insurance companies, that physicians are very alert to the possibility of CVA incidents associated with chiropractic manipulation and they tend to caution patients concerning this. Some chiropractors are of the opinion that this caution is partially motivated by professional prejudice and used as a fear tactic to try and discourage people from having chiropractic care. It may be that this issue is over-discussed by physicians as opposed to pointing out the risk of medical procedures or care that they themselves are involved in. In fairness, I have on occasion heard from neurologists across the country of other CVA occurrences that were of a minor nature in which patients recovered and no litigation was contemplated. It must be acknowledged that there may have been an element of under-reporting years ago, but during the last five years, it is highly unlikely that this problem

has escaped the attention of any health care practitioner. Claims experience indicates that significant injury will nearly always lead to litigation.

Of the 13 CVA incidents that have been documented, 12 were reported to and handled by the CCPA. One was handled by the private insurer of a chiropractor who did not belong to the CCPA. What does this claims experience tell us? If we round off the manipulations given to 100,000,000 over a five year period (see Table I), and if it is assumed that about half the manipulations were to the cervical spine, then the estimated minimum would be about 50,000,000 manipulations. Therefore, a calculated incident rate of 1 per every 3,846,153 manipulations performed over a five year period would not be an unreasonable figure, excluding the four eastern provinces. If the province of Quebec were isolated, with 14,000,000 manipulations performed in which only 1 CVA was reported in a 5 year period, there would be an incidence of one in 14,000,000. If the number of manipulations performed in the rest of Canada, from British Columbia in the west to Ontario in central Canada are examined in which 72,000,000 manipulations were performed; and if half of these (36,000,000) involved the cervical spine, then the figure works out to about 1 incident per 3,000,000 manipulations. These figures are as accurate as possible using the statistics available from both the association and the various provincial governments. If these figures can be assumed as reflecting the incidence of CVA's, then one questions if previous estimates have been overstated. The incidence may in fact not be anywhere near the previously stated rates of 1 in 400,000, 1 in 500,000, or 1 in 1,000,000 but may be significantly less than that.

### Reported complications

Regarding the reported 13 incidents of CVA, none involved death. In one, the patient had a complete quadriplegia, while six had minor but permanent damage such as loss of use of one arm or some neurological deficit (e.g. minor areas of numbness). Four cases completely resolved with no residual effect or sequelae, and in two the individuals were left with psychological problems but no physical disability.

The purpose of this report is to try to achieve some balance on the issue of reporting the incidence of CVA's. There has been much fear, over-reporting and scare tactics used on this issue; and, it is the author's opinion that physicians may have unreasonably exaggerated this issue of risk. When the estimated incidence of CVA's is compared to many other medical procedures in which the known risks are significantly higher, ranging from 1 in a 100 to 1 in 10,000 and frequently involving the chance of paralysis, death or other serious complications, then it can be surmised that this issue has been disproportionately publicized. It is the author's opinion that the benefit of cervical manipulation in relieving the pain and long term suffering from headaches or neck discomfort, establishes some perspective in balancing the significant but rare complications of spinal manipulative therapy.

## Conclusion

The actual incidence of CVA following manipulation is unknown and this would require a carefully conducted epidemiological study. However, the intent of this paper is not to try to negate the adverse reactions associated with spinal manipulative therapy. Rather, it attempts, albeit grossly, to estimate that the risk of serious sequelae is minimal and that the benefits may significantly out-weigh any risk or fear that might be associated with spinal manipulative therapy performed in the hands of a competent responsible chiropractor.

## References

- 1 Kleynhans A. Complications of and contraindications to spinal manipulative therapy. In: Haldeman Scott, ed. Modern developments in the principles and practice of chiropractic. New York: Appleton-Century-Crofts, 1980; 359-384.
- 2 Terrett AG. Vascular accidents from cervical spine manipulation: report on 107 cases. J Aust Chiropr Assoc 1987; 17(1):15-26.
- 3 Haldeman S. Mason v Forge, S/C/1959/82, Court of Queen's Branch, New Brunswick, Canada, decision dated December 17, 1984.
- 4 Guttman G. Injuries to the vertebral artery caused by manual therapy. Manuelle Medizin 1983; 21:2-14.
- 5 Dvorak J, Orelli F. How dangerous is manipulation to the cervical spine? Manual Medicine 1985; 2:1-4.
- 6 The Canadian World Almanac & Book of Facts 1989. Toronto: Global Press, 1989.
- 7 Statistics Canada Quarterly Demographics, catalogue No. 91-002.
- 8 Information provided by British Columbia Chiropractic Association and Provincial Health Plan.
- 9 Information provided by College of Chiropractors of Alberta and Provincial Health Plan.
- 10 Information provided by the Chiropractors' Association of Saskatchewan and Provincial Health Plan.
- 11 Information provided by the Manitoba Chiropractors' Association and Provincial Health Plan.
- 12 Information provided by the Ontario Chiropractic Association and Provincial Health Plan.
- 13 Information provided by the Association des Chiropracticiens du Québec.

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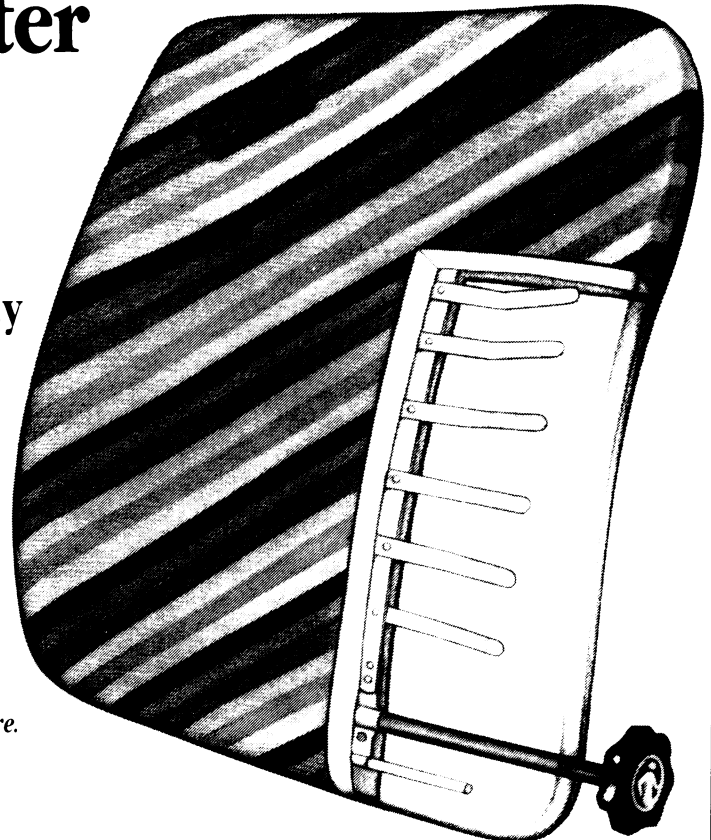
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